Also inside: How to Deal With a Toxic Team **40**
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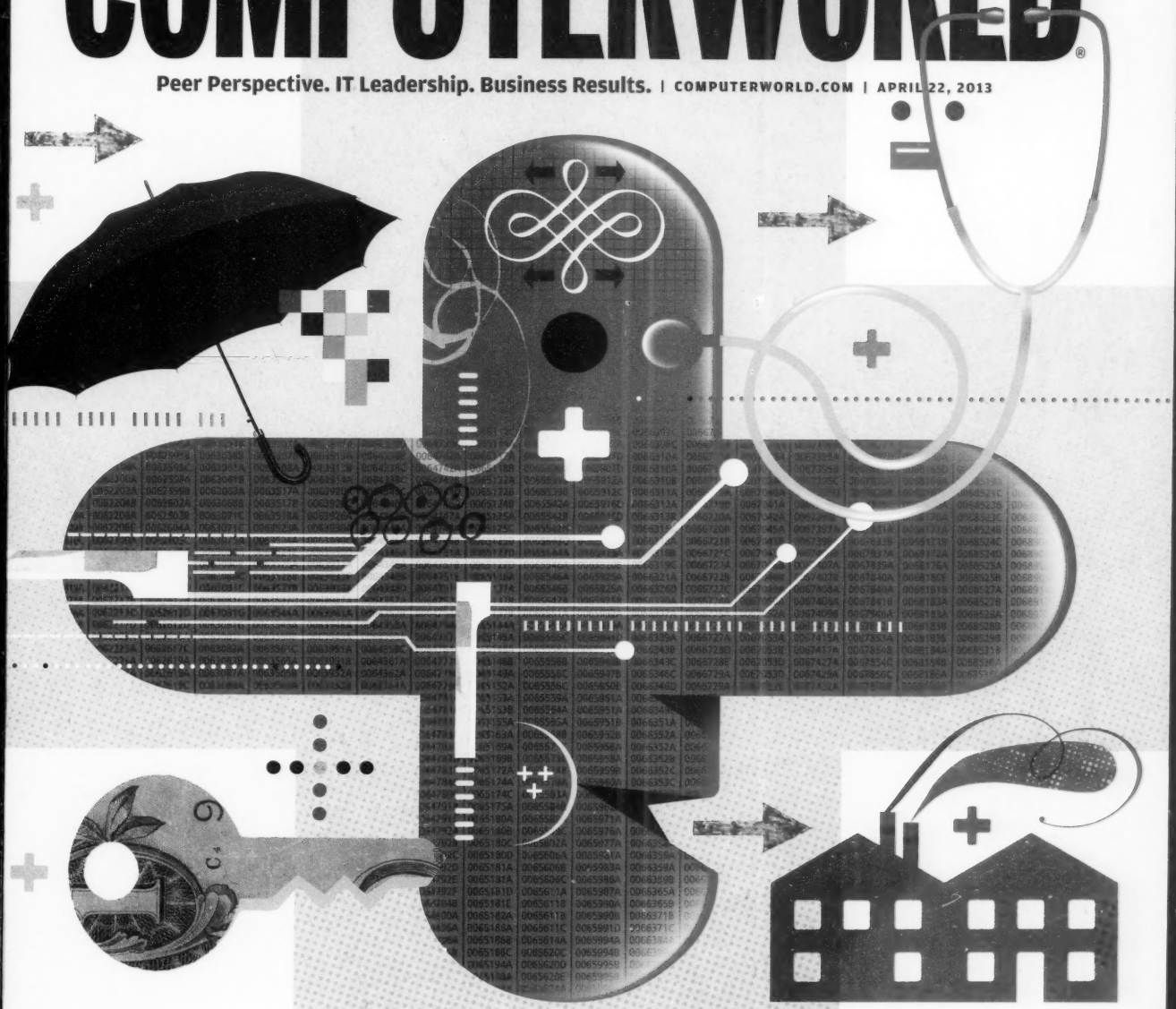

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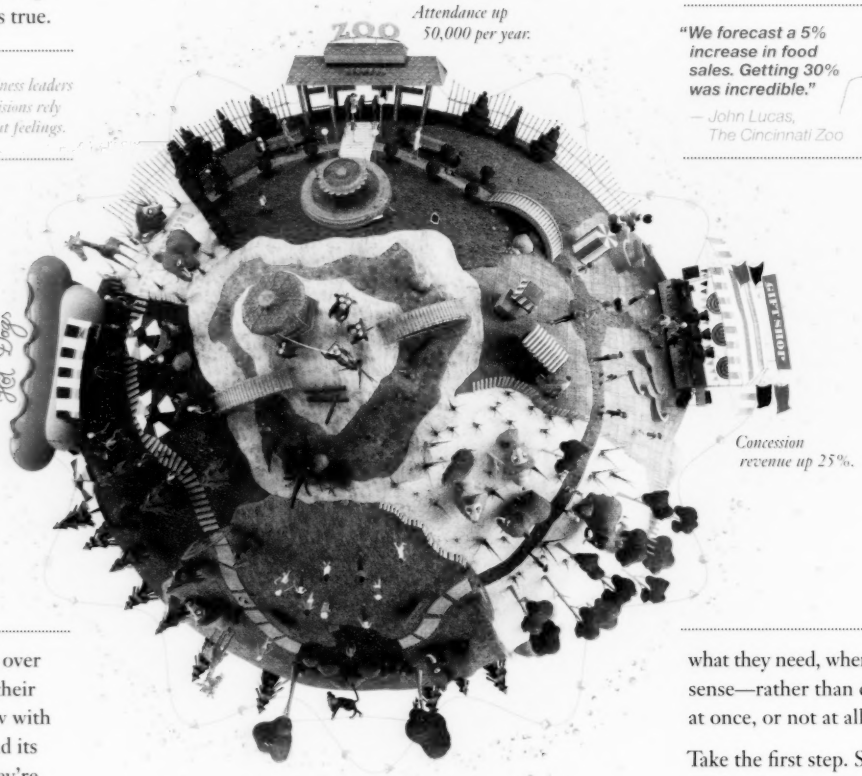
— John Lucas, The Cincinnati Zoo



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COVER STORY

IT Plus

16 Fast-changing business processes and ever-mounting regulations are complicating day-to-day operations – and making deep vertical industry expertise a must-have for IT professionals.

Squeezing Savings From the Cloud

24 To calculate, the real ROI of cloud apps you have to analyze a lot of factors, and shortcuts could short-circuit any savings.

New Task for CIOs: Make Money

30 Sure, all CIOs seek to add value, but some are developing systems that customers are willing to pay for.

HEADS UP | **2** A hospital map tool relies on **Wi-Fi.** | The jobless rate for **electrical engineers** spikes. | **4** Easy **XP-Windows 7 upgrades** are history. | College-level **Cobol** classes grow scarce.

NEWS ANALYSIS
6 Microsoft faces a loss of relevance as user **aversion to Windows 8** leads to a drop in PC sales. | **8** **Smartphone** photos and videos were key to the Boston bombing probe.

OPINIONS | **14** **Bart Perkins'** advice is to keep self-destructing messages out of the enterprise. | **34** **Steven J. Vaughan-Nichols** thinks the CIA's embrace of the cloud will usher in wider acceptance. | **40** **Paul Glen** lists the five warning signs that you have a toxic project team.

DEPARTMENTS | **10** **The Grill:** 'Retained' CIO Laura Pettit Rusick | **33** **Security Manager's Journal:** A little housecleaning | **36** **Career Watch** | **38** **Shark Tank**

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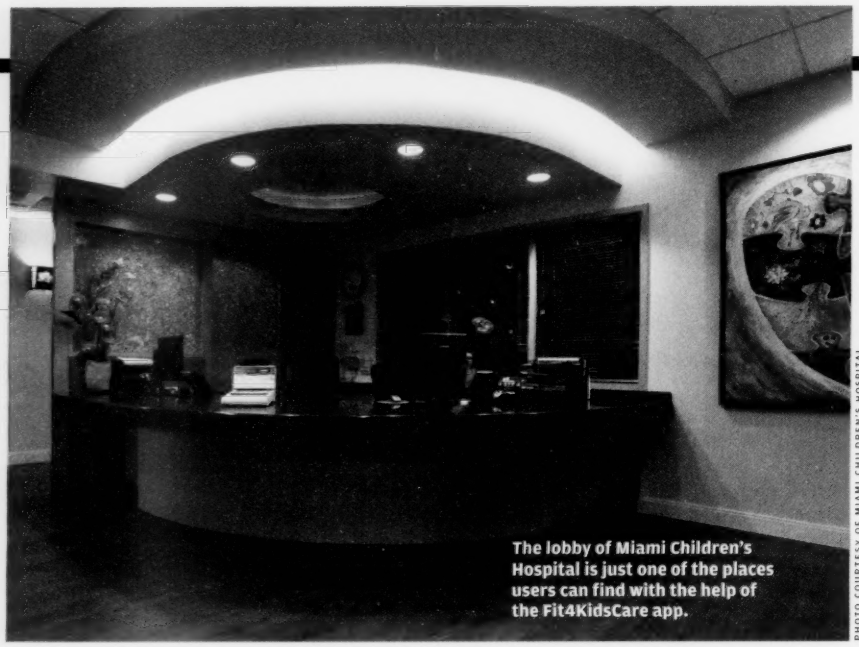

The lobby of Miami Children's Hospital is just one of the places users can find with the help of the Fit4KidsCare app.

PHOTO COURTESY OF MIAMI CHILDREN'S HOSPITAL

MOBILE APPS

Hospital Picks Wi-Fi for Mapping App

MIAMI CHILDREN'S HOSPITAL recently launched a free iPhone app that uses Wi-Fi triangulation to help patients and their families find their way around the medical center.

The app, called Fit4KidsCare, is even designed to detect vertical distances — a feature that's helpful for users who are riding in elevators, said Edward Martinez, CIO of the 280-bed hospital.

"We have pretty good signage in the hospital, but one of the biggest concerns we face is people asking for directions, so this app adds a level of customer service," he said.

Fit4KidsCare will eventually be ported to other smartphones. The total cost of the initial deployment was about $30,000.

Most navigation apps rely on satellite GPS signals, which can support readings that are accurate to within three to five meters.

Miami Children's used Cisco software to set up triangulation that relies on input from hundreds of Wi-Fi access points, Martinez said. According to Cisco, its software can bring accuracy to within one meter.

Martinez said he got the idea for the app from a similar service at New York's Museum of Natural History. "You use the same model to triangulate to get from the dinosaurs to the whales," he said. "I figured the model could be used to go from a hospital bed to a lab," he said.

Eventually, Martinez hopes to connect the app to telemedicine robots that roam the hospital hallways. With that technology, he said, the robots could be used to do things like carry lab specimens or food trays.

– *Matt Hamblen*

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IT CAREERS

Jobless Rate For Electrical Engineers Soars

The unemployment rate for people at the heart of many tech innovations – electrical engineers – rose sharply in the first quarter of this year for reasons that aren't clear.

The number of electrical engineering jobs declined by 40,000 in the first quarter, and the category's unemployment rate rose to 6.5%, according to an analysis of U.S. Labor Department data by the IEEE-USA.

In 2010 and 2011, the unemployment rate for electrical engineers held at 3.4%. In 2012, there were 335,000 electrical engineers in the workforce, said the IEEE-USA. That figure now stands at 295,000.

"The first-quarter unemployment spike is alarming," Keith Grzelak, the IEEE-USA's vice president of government relations, said in a statement.

The TechServe Alliance, which represents IT services firms, said the head count of the overall IT workforce reached 4.4 million in March, an increase of 14,800 from February. Demand for IT professionals is strong, "with shortages [of people with] many skill sets," said TechServe CEO Mark Roberts.

But that's not true for electrical engineers. And that could be a problem, because for a country to have wealth, you need engineers who can "make something out of nothing," said Victor Janulaitis, CEO of Janco Associates, an IT employment research firm.

– PATRICK THIBODEAU

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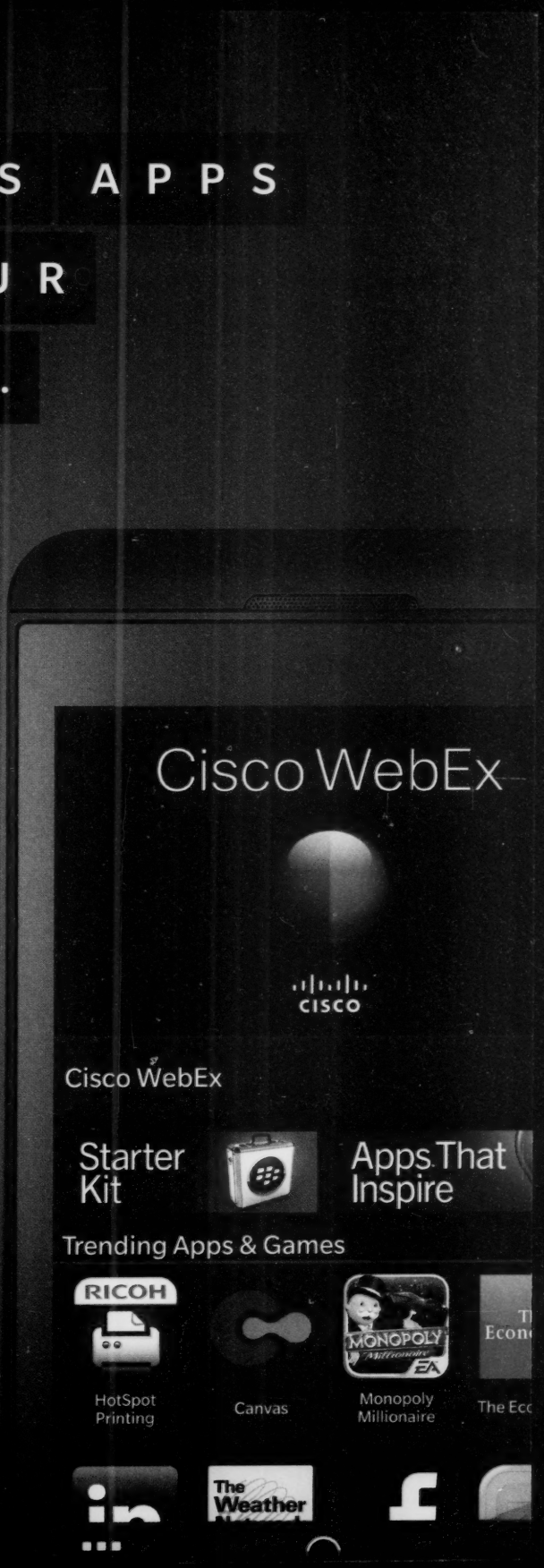


BETWEEN THE LINES
By John Klossner

OPERATING SYSTEMS

Easy XP-Windows 7 Upgrades Are Over

THE EASY UPGRADES from Windows XP are done, say migration experts, who predict that a sizable number of large enterprises will still be running the aged operating system after Microsoft stops supporting it.

Microsoft plans to retire Windows XP from all support, including security patches for the public, on April 8, 2014.

"Our studies have shown that large enterprises have made the least progress in migrating from Windows XP to Windows 7, with 64% yet to complete their migrations," said Betty Junod, director of desktop product marketing at virtualization vendor VMware.

Slightly more than half of midsize organizations have not finished migrating, she added.

Browsium, whose Ion tool lets users run older versions of Internet Explorer inside newer editions of Microsoft's browser, agreed. "What's left are the difficult and expensive migrations facing the largest of enterprises," said Gary Schare, the company's president and COO.

"Our typical customer is a big, old organization — banks, healthcare, government," Schare said. "And every single one of them is stuck on its migration" from XP to Windows 7.

Data published by Web metrics vendor Net Applications can be used to roughly plot XP's future usage share. If the average decline of the last 12 months holds, XP will still be the operating system in use on 33% of all PCs running Windows at the end of April 2014.

As for the corporate market, Microsoft CFO Peter Klein said in January that 60% of all enterprise PCs were running Windows 7. Since few businesses adopted Windows Vista and even fewer have jumped on Windows 8, almost all of the remaining 40% are likely running Windows XP.

If Microsoft stops support on schedule, around 450 million PCs — by *Computerworld*'s calculation using Net Applications data — will be running without the safety net of Microsoft's patches.

– *Gregg Keizer*

Micro Burst

The federal government received

124,000

petitions for H-1B visas for fiscal 2014. That's 39,000 more than it can fulfill.

APP DEVELOPMENT

College-level Cobol Classes Grow Scarce

At universities today, Cobol is often taught as an elective, if it's taught at all – and that could create staffing problems for large enterprises.

Billions of lines of Cobol code are still in use at large businesses and in government agencies.

"I professionally think that Cobol is alive and well," said David Dischiave, an associate professor at the Syracuse University School of Information Studies.

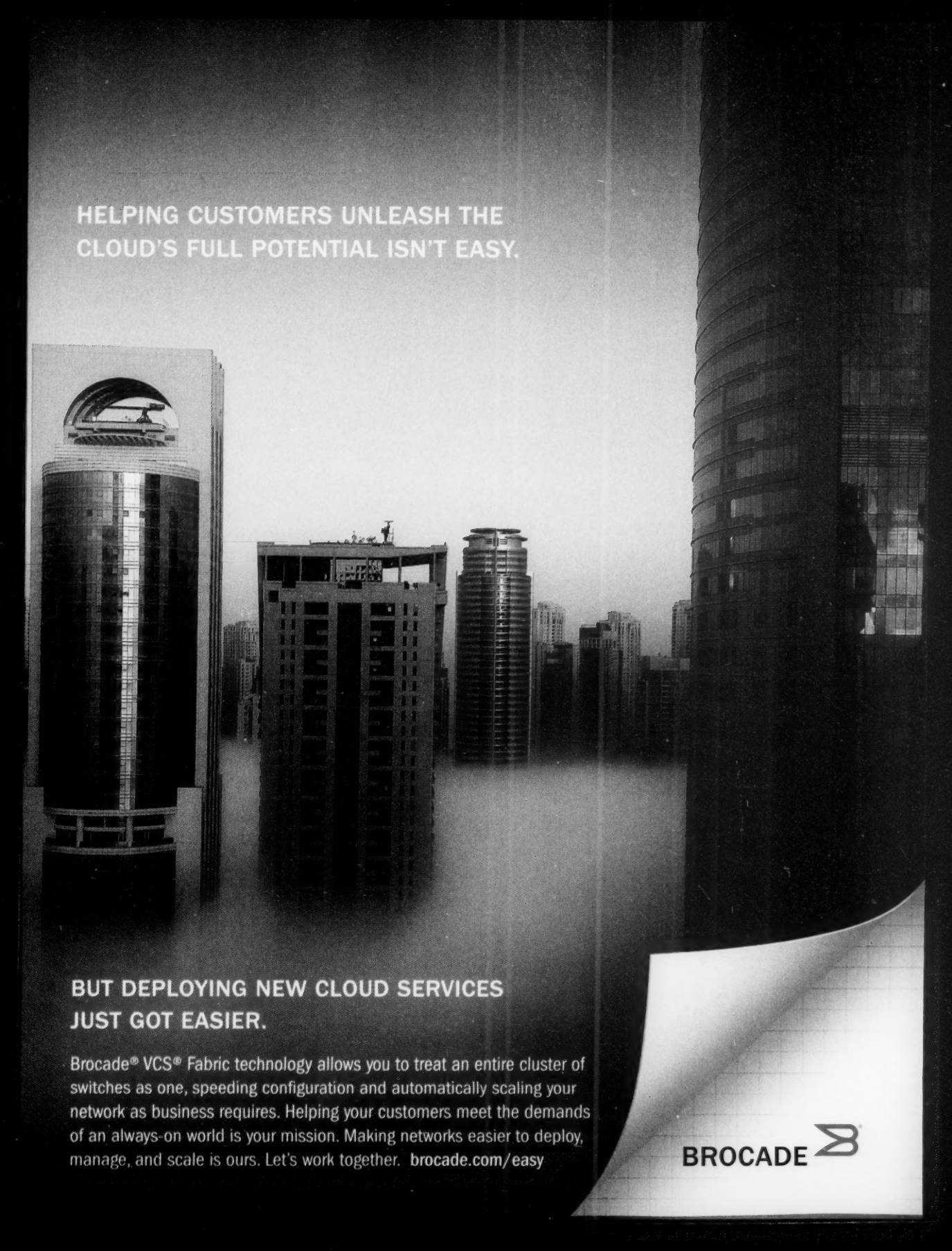
A survey of 119 universities by Micro Focus, a maker of software for developing and modernizing enterprise systems, makes clear that organizations that need Cobol expertise may face staffing problems.

Micro Focus said that 73% of the universities polled don't offer Cobol programming classes. Of the rest, 18% have Cobol as part of their core curriculum and 9% offer Cobol courses as electives.

Meanwhile, 71% of the respondents said that they believe businesses will continue to rely on Cobol-based applications for at least the next 10 years.

The University of Alabama at Birmingham doesn't teach Cobol. "The demand just wouldn't justify us even offering a class," said Paul Crigler, a computer instructor at the UAB School of Business.

– PATRICK THIBODEAU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Microsoft Faces a Loss of Relevance

The company is struggling to maintain its place in tech in the face of a badly received Windows upgrade, faltering mobile efforts and the spread of BYOD in its corporate base. By Gregg Keizer

MICROSOFT TOOK another hard knock this month when top tech researchers laid much of the blame for dwindling first-quarter PC sales on the beleaguered Windows 8 operating system.

Estimates of first-quarter shipments, from both IDC and Gartner, paint a gloomy picture of the PC industry — a sector that Microsoft still needs to be strong.

IDC said its estimate of a 14% decrease in worldwide PC shipments is the largest year-over-year decline it has ever seen in its nearly two decades of tracking those numbers. Gartner pegged the global PC downturn at 11%.

While a drop was expected, its size had one analyst searching for words. "It's brutal," said Bob O'Donnell of IDC. "These are disastrous numbers. Huge."

IDC cited a now-familiar litany of confusing Windows 8 traits that are causing users to shy away from new PCs: The bold-but-radical move to the tile-based "Modern" user interface; the removal of the Start button and menu from the "Classic" desktop UI; and a touch-first strategy.

IDC analyst David Daoud listed other factors, including the saturation of the PC market, especially in developed countries like the U.S., the fact that PCs bought since 2008 remain "good enough" for users, and stagnant economic conditions in some parts of the world.

The PC numbers are but the latest threat to Microsoft's influence and relevance in the technology industry.

The company in recent years has been hurt by a shift to tablets and smartphones and is threatened, even in its enterprise stronghold, by new demands from business users — especially those who are spearheading the bring-your-own-device (BYOD) movement, said Gartner analyst Carolina Milanesi.

Unless Microsoft can turn around its faltering mobile strategy, it risks losing its prominent standing in an industry it has dominated for decades, she said.

"They need to win the consumer battle," Milanesi said. "To remain relevant, to remain an influencer, [Microsoft needs] consumers to seek out its products."

Even if it loses relevance, Microsoft will remain a major company for years to come because of its place in the enterprise, noted Frank Gillett, an analyst at Forrester. "Because of the huge installed base of Windows, and sales that will continue to grow gradually, Microsoft will remain relevant in the enterprise," he said.

But even there, Microsoft faces big challenges.

For instance, many corporate and government workers are flexing their muscles by bringing in their own devices, which in many cases aren't powered by Microsoft operating systems. "They'll still be the dominant operating system, but they'll have to deal with BYOD," Milanesi said.

Analysts did note that Microsoft is making some encouraging moves, most notably its work on "Blue," the code name for both a refresh of Windows this year and for a multiyear initiative designed to dramatically speed up the development and release tempo of the platform to put it on a more equal footing with the release pace of mobile operating systems.

Microsoft has time to correct its course, but the window is closing.

"2013 is still a transitional year, I think, even from a consumer perspective," Milanesi said. "But 2014, starting with this year's holidays, is where we need to see some momentum from Microsoft. Blue getting to market and different form factors may be the start." ◆

> To remain an **influencer,** [Microsoft needs] consumers to seek out its products.
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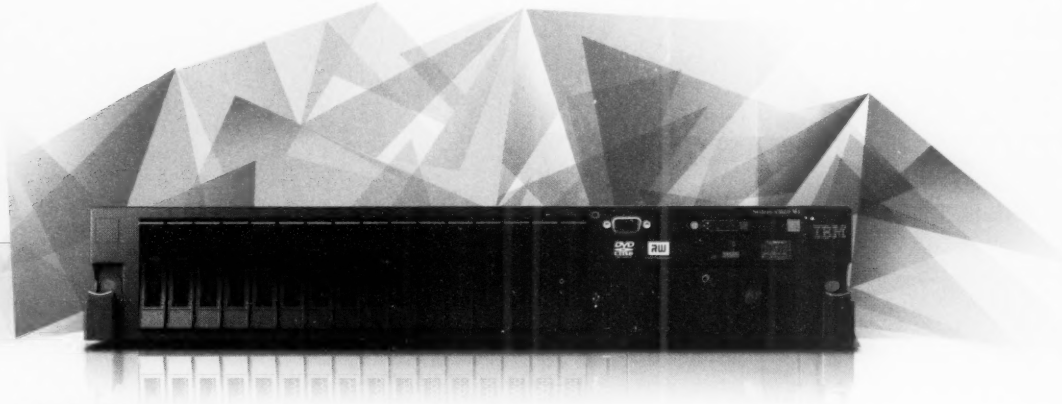

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An explosion erupts as runners approach the finish line of the Boston Marathon, in this photo by Dan Lampariello, who was tweeting from the site.

Tech Aids Boston Bombing Probe

Social media kept communication flowing during the disaster, and smartphone photos and videos were seen as critical to solving the crime.

By Matt Hamblen and Zach Miners

USERS OF CONSUMER TECHNOLOGY and social media reacted quickly after explosions ripped through crowds near the finish line of the Boston Marathon last week, sending out updates and snapping photos and recording videos that officials said would be "critical" pieces of evidence in their investigation into the bombings.

In the hours after two bombs exploded within 100 yards of each other in Boston's Copley Square shortly before 3 p.m. on April 15, the FBI set up a hotline for citizens to use to tell investigators about photos and videos taken in the area at the time of the incident. On Thursday, investigators released surveillance photos of two suspects and asked the public for help identifying them. A massive, sometimes violent, manhunt ensued and continued into the day on Friday.

Early in the investigation, police stressed that photos and videos would be crucial to solving the crime. "It's our intent to go through every frame of every video we have," said Boston Police Commissioner Ed Davis a day after the bombing.

FBI special agent Richard DesLauriers, who leads the investigation, also said last week that "assistance from the public" would be critical.

Investigators were so eager to get smartphone images related to the bombing that Massachusetts State Police detectives were asking passengers checking in for flights at Boston's Logan International Airport if they had pertinent videos or photos.

"They were asking, 'Was anybody there who had any images?' " said Will Stofega, an IDC analyst who was at the airport and was asked about images by investigators.

Jack Gold, an analyst at J.Gold Associates, said collecting and processing bombing-related images amounted to a "truly massive challenge."

While there are software tools galore to help with facial recognition and pattern recognition, "it still comes down to having human eyes sort through sources of interest," Gold said. "Despite our strides in video analysis and image processing, at the end of the day, the systems we have in place are still childish in their abilities compared to humans."

Keith Jones, an independent computer forensics examiner, expected investigators to comb through social networks looking for "online discussions about planning the attack."

Meanwhile, Twitter users near the marathon finish line started tweeting as soon as the bombs exploded, and their actions illustrated both the upside and the downside of the use of social media in emergencies.

For instance, Twitter was a useful communications tool for public authorities like the Boston police and marathon organizers, but many people also used it to spread reports that were questionable or just plain inaccurate.

Social media "cuts both ways," noted Greg Sterling, an analyst at Opus Research. "It allows you to get the information out more quickly, but it can also fan hysteria."

The Boston Police Department's Twitter log showed the positive side of social media. It was updated minute by minute in the aftermath of the bombings, often with instructions to avoid certain areas, or with information about where police officers might be stationed. It was also a source of information on Friday as police warned residents in Boston and surrounding communities to stay indoors as the suspects were sought.

Other social media sites were also useful sources of information. For instance, Google set up a Person Finder, as it did after the Japan earthquake two years ago, to help people connect with friends and loved ones after the incident. ◆

Miners *is a reporter for the IDG News Service.* **Sharon Gaudin** *contributed to this story.*

> It's our intent to go through **every frame of every video** we have."
>
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THE Grill

Laura Pettit Rusick

This CIO-for-hire gets inside dozens of IT groups, and sees a lot in common.

Favorite tech toy: "It's very utilitarian, but my smartphone, which is a Droid Razr Maxx. I can't live without it."

Why tweet? "I use it as an outgoing communications tool. I don't tweet very often, but I tweet out articles that I think would be interesting to my followers."

If you weren't in IT, what would you be? "An architect. From the time I was a little kid I was drawing floor plans."

What's your next career step? Continue to grow the company and open additional offices.

Hobbies: Golfing and showing my dog, a Belgian Tervuren, at American Kennel Club dog shows.

AS PRESIDENT *of OPT Solutions, a provider of IT management services, Laura Pettit Rusick has spent the past seven years working as an interim "retained" CIO, leading IT departments at multiple small and midsize companies, mostly on a part-time basis. The experience has given her new insight into the technology challenges and opportunities that exist in a wide swath of U.S. businesses. Rusick, a member of the Society for Information Management who had worked in full-time IT management positions in larger organizations before becoming an outsourced CIO, says her current work has shaped her perspective on what it takes to be an effective executive.*

What are the greatest challenges you face as a retained CIO? One is certainly balancing time. We're typically not on-site eight hours a day. We're flexing our time throughout the week. With multiple clients, often the peaks of work will balance themselves out, which is nice. But there are times when scheduling can get pretty interesting. I find if

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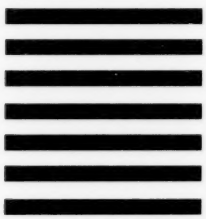

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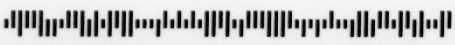

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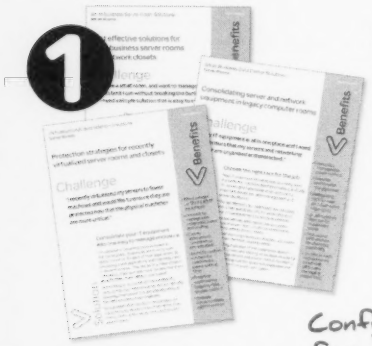

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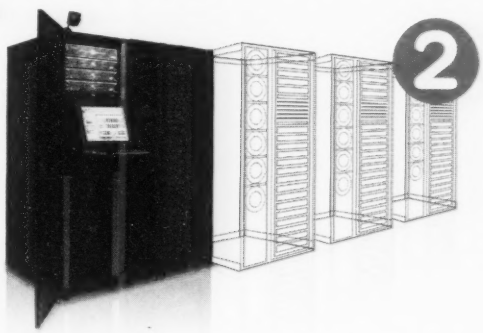

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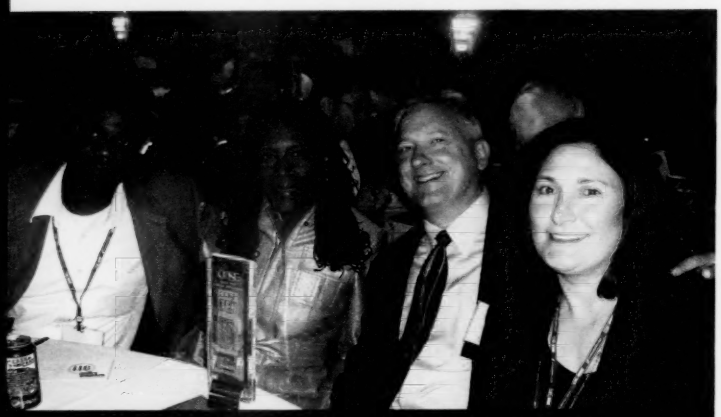

Laura Pettit Rusick (right) at the 2010 Council of Smaller Enterprises 10 Under 10 Awards banquet.

> **There is a commonality of people living with software beyond its useful life cycle.**

there's a crisis, clients will understand. The other piece is not having as much face time.

Does being an interim or outsourced CIO give you some advantages over a full-time exec? From a CEO's perspective, it really does give advantages. It would be cost-prohibitive for a lot of midsize companies to hire a full-time experienced CIO. And you have the experiences of working with other clients at the same time, so, for example, you could have a software selection going on in one organization and two months later have the same thing somewhere else. That cross-pollination is very helpful to the client. And bringing in best practices regardless of industry is important as well. The other piece of it I've found is that I have a much better network than I ever had as a full-time CIO. So I'm able to bring people to the table. I've had CEOs ask for certain kinds of people because they know I have those resources.

How do you quickly establish trust and expertise? I find that being frank while being empathetic is a big part of the equation. People want you to be honest but because they've been living with a bad situation for a while they also don't want to be criticized for it. It's about how we move forward. The other piece is a pure business piece. As soon as you can show or discuss early benefits by identifying new benefits or talking about risks they didn't know existed, it's a way to gain credibility.

How do you quickly build and then manage relationships? It's much more difficult in a retained situation to have, for example, regular lunches with the executive team. But [companies] have full-time employees who travel all the time, so [like them] you're dealing with conference calls, you have to be responsive to emails, having scheduled face time on-site. That's very helpful. You can see the people and hear their experiences and the side conversations that are helpful to understanding what's going on and making sure things aren't going sideways. And some of it is typical relationship stuff — using humor where appropriate, watching yourself under stress because people really look to you to see how they should react.

As someone who gets an inside look across multiple organizations, what are the biggest technology challenges they have in common? I've found, particularly after the past recession, that investments got delayed so they're dealing with outdated software, infrastructure, servers and networks that have not been updated in some time. So you have some basic foundation issues that are challenges, and it makes it really difficult then to work on the projects that make them more nimble as a company to serve their customers better. Another thing that's common is that companies are relying on IT staff who aren't serving the company well. Their roles have been expanded beyond their capabilities, their responsibilities don't mesh with the company's culture, they're not customer-service-oriented, but [the companies are] afraid to make changes. It's really a big issue out there.

Do you see any common errors across organizations? There is a commonality of people living with software beyond its useful life cycle. My favorite one is phone systems out of warranty for years and you ask the business: What would happen if your phone system went down? They look at you with horror. They don't know the risk to the business they have.

You work with small and midsize companies. What will they need from technology to be competitive in the future? They have to have a strong IT foundation. They have to have good basic applications and they have to have a hardware infrastructure that in general is up to date so they can be more nimble. [When they have that] then you can get into what enables that specific business to be more competitive. And the other part of it, and it's a constant quest, is the need for better data or the ability to have the data in a format that can be analyzed. That's always been a need, but the need for data is increasing.

What are their biggest obstacles in meeting those IT goals? There are so many things people want to do, but you can't tackle it all at once. So it's having a longer-term vision and finding all the pieces first, all the project work that needs to get done to fulfill that, while at the same time being able to adjust course because nothing is stagnant. And having patience.

— *Interview by* Computerworld *contributing writer* **Mary K. Pratt** *(marykpratt@verizon.net)*

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OPINION

BART PERKINS

The Seeds of Self-Destruction

Self-destructing messages may be a boon for individual privacy, but they will bring headaches to enterprises.

"THIS MESSAGE WILL SELF-DESTRUCT IN 10 SECONDS." That variation on the old *Mission: Impossible* trope is now the business model for several companies. But the services they offer, while beneficial to their users, pose problems for organizations that need to retain records, monitor employee activities or keep an eye on communications — in other words, most organizations.

Snapchat, Wickr, Burn Note and others attempt to make electronic communications as private as face-to-face discussions. Snapchat allows users to send silly or embarrassing photos that self-destruct within 10 seconds after being opened, and it notifies the sender if the receiver attempts to capture the image by screenshot. Wickr uses "military-grade" encryption to send self-destructing voice, text or audio files, and it allows senders to control who can access the message and for how long. Burn Note maintains all messages in memory with no disk backup. When opened, messages are deleted, along with all sender and receiver information. All of these services are a big advancement for individual privacy.

But that benefit can be at odds with the needs of the enterprise. Consider the following headaches that can ensue when your employees use these new technologies:

Records retention nightmares. Retention policies typically require archiving all electronic and paper messages for a period of time that is usually specified in years. These policies even cover trivial messages, such as invitations to lunch or birthday greetings. Obviously, messages that self-destruct can't be retained. And any message that can only be read by the designated receiver can't be moved into a standardized archive.

Retention, of course, can be a matter of law. The federal Freedom of Information Act requires strict adherence to retention guidelines. Many states and foreign countries have similar laws. Self-destructing messages would make total compliance difficult or even impossible.

Inability to prove guilt or innocence. Organizations have an obligation (fiduciary, if not statutory) to be on the lookout for insider trading, sexual harassment, corporate espionage and other nefarious activities. When such activities are carried out using self-destructing messages, the electronic trail is obliterated, and punishing the guilty becomes difficult. Moreover, the use of self-destructing files to transmit inappropriate thoughts or images can open an organization to charges that it failed to adequately supervise its employees.

Difficulty making a business case. Most organizations will find it hard to justify policies permitting the use of self-destructing messages. True, this type of technology could provide a safe way for people to transmit sensitive information in totalitarian countries. But it introduces a lot of risk in a run-of-the-mill business operation, because self-destructing messages make it possible to surreptitiously send confidential corporate data to competitors, customers, outsourcers, stock traders or the press.

Banning technology is rarely the best approach, but if self-destructing messages are not necessary for your enterprise's operations, keep them out. Update corporate policies, publicize your position and use device management software to prohibit such apps from the enterprise network.

They significantly increase the risk that bad things will happen. And the scariest part is that you will never even know. ◆

Bart Perkins is managing partner at Louisville, Ky.-based Leverage Partners, which helps organizations invest well in IT. Contact him at BartPerkins@LeveragePartners.com.

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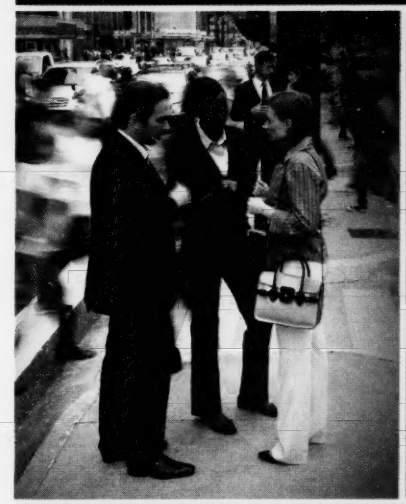

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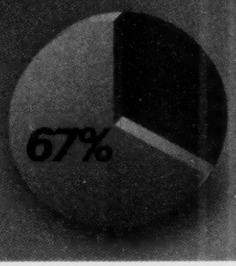

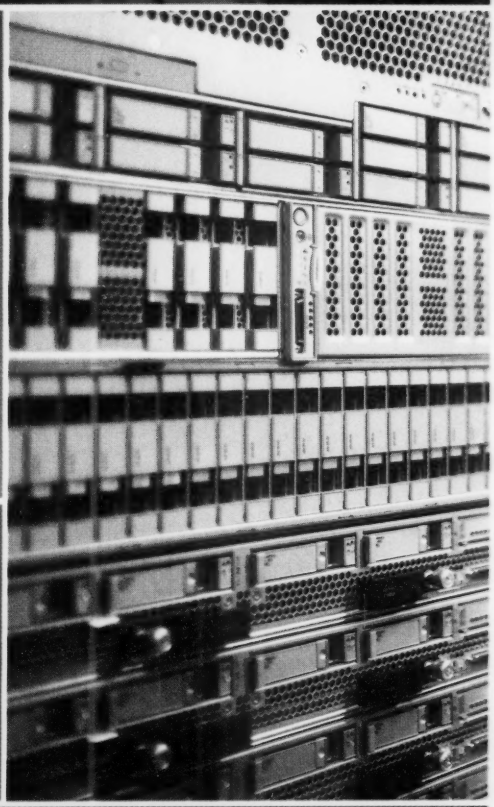

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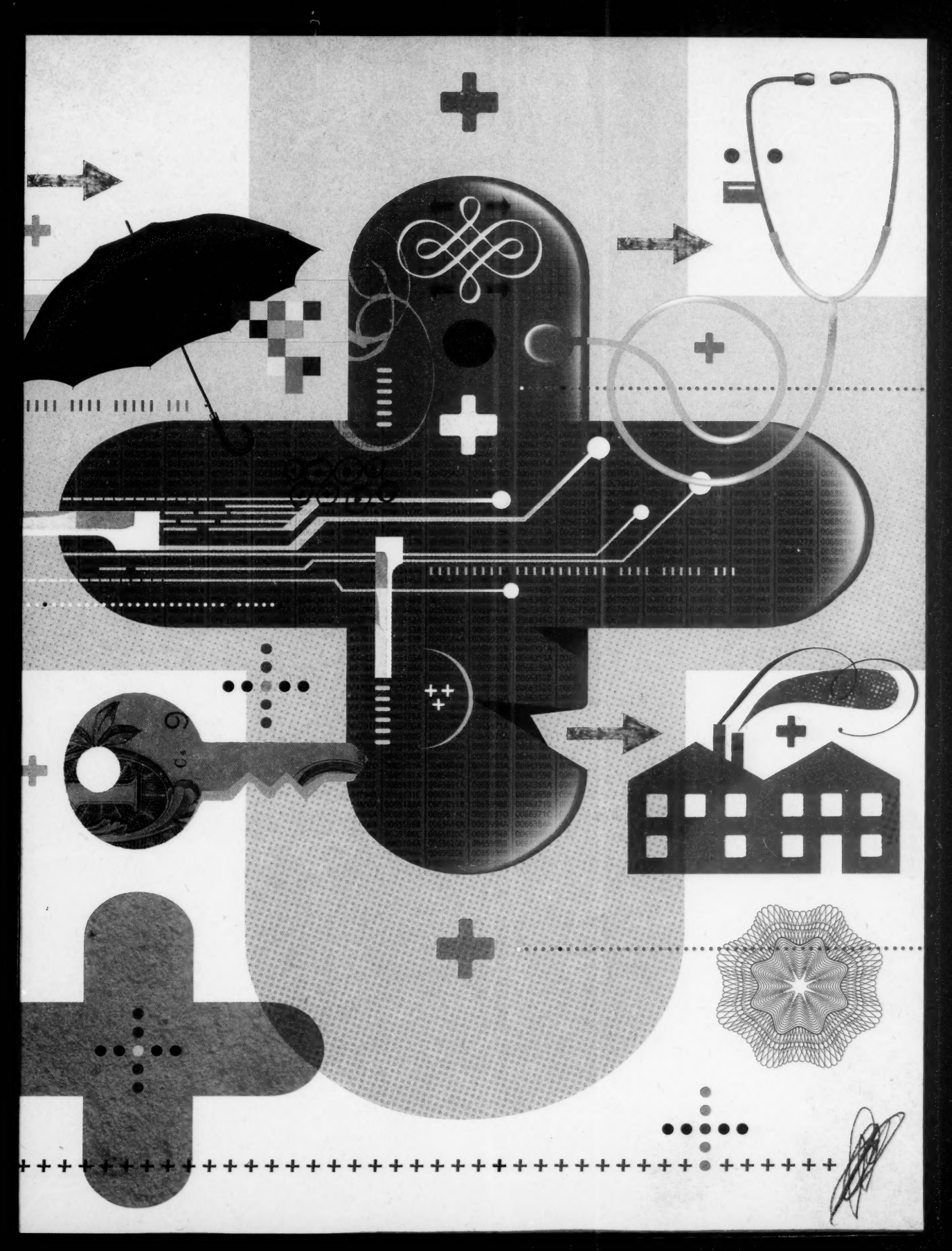
IT plus

Fast-changing business processes and ever-mounting government and industry regulations are complicating day-to-day operations — and **making deep vertical industry expertise a must-have.** BY JULIA KING

ONE OUT OF FIVE IT staffers on the clinical applications team at Continuum Health Partners in New York is also a nurse, a pharmacist or another type of clinical specialist. For IT managers and directors, a clinical degree is a must.

At $1.3 billion Grange Insurance in Columbus, Ohio, CIO Michael Fergang exclusively recruits IT staffers with insurance industry experience.

WALTER VASCONCELLOS ILLUSTRATION



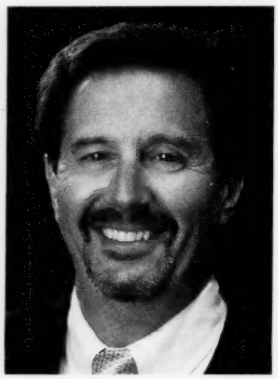
Sam Lamonica, CIO at $750 million Rosendin Electric, has taken to luring experienced engineers and operations people in the field to work in IT. Lamonica also admits to "stealing shamelessly" from Rosendin's competitors.

It's not that San Jose-based Rosendin doesn't already have a fabulously talented and experienced IT staff, Lamonica says.

"We have a number of really smart analysts on our business applications team who are mathematics majors as well [as technologists]. The challenge is they're fairly clueless about what goes on at a job site on a given day," he says. And Rosendin typically is working more than 1,500 multimillion-dollar jobs simultaneously in any given month.

My managers are better businessmen than technologists.

MICHAEL FERGANG,
CIO, GRANGE INSURANCE



Candid CIOs from healthcare, financial services and manufacturing all tell a similar story. Fast-changing business processes, the need for speed, consumers' insatiable appetite for customization and the need to comply with a growing list of government regulations and industry standards are all working to complicate day-to-day operations beyond the most business-savvy technologist's ability to keep pace. Now what is critically necessary are not only technical skills and business knowledge, but also deep industry expertise, the kind that comes from calculating a quote and selling an insurance policy or calibrating and administering intravenous pain medication to a cancer patient, for example.

Think of it as IT-plus.

"At the end of the day, you need a person who gets it all," says Continuum CIO Mark Moroses.

Healthcare reform and the hyper-accelerated pace of change are two of the biggest factors driving the need for IT-plus credentials at Continuum, says Moroses.

"The healthcare industry is highly regulated," and adherence to those regulations is what makes or breaks the bottom line, he says. Under state and federal regulations, Continuum, a partnership of New York's Beth Israel Medical Center, St. Luke's Hospital and Roosevelt Hospital, reports to 11 regulatory agencies. On top of that, there are the hundreds and hundreds of regulations and reporting requirements imposed by insurance companies.

"Getting technical people to understand regulations is tough because it's a field they're not interested in," says Laurie Anne Buckenberger, Continuum's assistant vice president of corporate IT and a nurse practitioner. Clinicians, on the other hand, live and breathe healthcare regulations from the time they enter the field.

To retain certification, hospitals are required to follow and regularly report on 157 different quality measures. "On your first job as a staff nurse, you're taught about the requirements of the Joint Commission on Accreditation of Healthcare Organizations," Buckenberger says. "It's also embedded in you from the time you start [nursing] school."

That's why "you can't do it without clinical people," says Moroses. It's also why a clinical degree is a requirement for members of the applications support team at Continuum.

The need to work quickly is another key factor driving the clinical requirement, which Moroses says evolved over time.

"Before, programmers and analysts were separate. Then we took the IT person and put them in the business unit and called them a business analyst," Moroses says. "But at the end of the day, you need one person who gets it and does it. In healthcare, you need that clinical component and technical component. You have to eliminate the translation requirement because of the speed of business."

Consequently, Continuum has broadened the reach of its IT recruiting efforts. Company representatives now visit nursing schools to try to persuade students to consider careers in IT (see story below).

A nurse with firsthand clinical experience would, for example, be uniquely qualified to explain why a smaller, lighter tablet would be better than a laptop for a home healthcare provider, says Moroses.

The New Face of IT

LAURIE ANNE BUCKENBERGER, a veteran healthcare professional with a graduate nursing degree from Columbia University, has worked as a staff nurse, a nurse manager and a nurse practitioner. She got her start in IT as a so-called super user.

"Because I had worked [as a nurse] at NYU, where they had an electronic medical record, I got put on the EMR search committee at Beth Israel Hospital," she recalls. "I was very vocal about end-user workflow and what end users needed."

At the time, she was still treating patients. Today, Buckenberger is an assistant vice president of corporate IT and an active IT recruiter for Continuum Health. Her target hires are other nurses, pharmacists and lab technicians. She advertises in nursing journals.

"I'm actually looking for clinical people to teach them the technical side," she says..

"There have been a few technical people who have been successful in embedding themselves in the clinical workflow and understanding it, but a lot of technical people are really challenged because [healthcare] is a highly variable field," she says. "What you do for one patient you don't do for another. If an interface goes down at 7 in the morning, it's a crisis because it's rounds at the hospital. If it happens at 2 a.m., it has a completely different impact. Clinical people know this." – JULIA KING

At the end of the day, you need a person who gets it all.

MARK MOROSES, CIO, CONTINUUM HEALTH PARTNERS

"In order to help the industry transform at this quick pace, you need this clinical part in IT," he says. "The [companies that] can transform the quickest [will have a] competitive advantage."

"It's hard for a pure IT person to understand what emergency departments and other clinicians need," he adds. "Yes, they need mobility, but not just mobility. They need mobility in certain ways."

IT-plus credentials can give IT staffers instant credibility in the eyes of users, says Moroses.

"If we're having a conversation about a system upgrade or bringing in new functionality, you need a nurse or physician talking to a nurse or physician," says Moroses.

Before Continuum started bringing clinical people into IT, "there was always skepticism that IT didn't really understand what we do," says Moroses. "The radiology group would have their own shadow IT department because they didn't trust anyone [in IT] to get the way things needed to be configured."

Now, in contrast, someone from IT "walks in with a clinical degree and there is a built-in credibility for talking to people in the clinical community."

At Grange, Fergang characterizes IT professionals with deep technical knowledge plus insurance industry experience as "foundational" to innovation.

"We have skunk works where IT people get together and come up with business solutions. We prototype these for presidents of divisions, but there's no business involvement. You couldn't do this without IT-plus business knowledge," he says.

In one of these projects, IT built a prototype that let Grange sales agents represent various policy alternatives in a single quote system. Agents could change key parameters such as deductible amounts, driver type and risk levels so customers could customize their own policies.

"Knowing our business, we could take a single quote and represent it in different ways," Fergang explains.

In another project, IT created a series of transaction-driven alerts for agents. The alerts notify agents about events that affect their customers and/or their sales performances. For example, an agent might be immediately alerted if a customer called the insurance carrier, rather than the agent, to make a change to his policy.

"We created the first six alerts knowing what the business needed," Fergang notes. Since then, there have been more than two dozen ideas for additional alerts.

"If you understand the business and the business strategy, I really do believe IT is in a unique position in that it can bring business solutions to the business that the business can't even imagine," Fergang says. But you have to have the right business aptitude, he adds. "My managers are better businessmen than technologists," he says.

Valuable Time in the Field

In the increasingly complex construction business, Rosendin's Lamonica says engineers and others from the field are much better qualified than IT specialists when it comes to building and supporting software applications and other automated tools used on job sites. They know about workflows, contractor scheduling and overall construction project management, he says.

This expertise is becoming even more important as the industry moves more toward the time-sensitive practice of installing prefabricated assemblies rather than building on-site.

"Prefabrications save a ton on time and money, and the project manager has to know when they have to go [on-site]," Lamonica explains. Most construction sites are space-constrained and don't have a lot of extra room to store an inventory of prefabricated modules. Instead, prefabricated components for big projects, like a 20-floor hospital building, are ordered, built off-site then shipped to the project site on a just-in-time basis. "We in IT wouldn't have a clue how that works," he notes.

Lamonica regularly dispatches technical IT staffers to the field to learn from construction workers who are using automated and mobile tools. He also recruits field staffers to spend a year or two in IT as a way to offer on-the-job training.

"These are people with construction experience" and knowledge that is critical to IT if the company is to design and deliver tools that are truly efficient and productive in the field, Lamonica says.

"But the big challenge is that we can have 1,700 jobs going on at the same time," which makes it very difficult to keep pace with demand, he says. On-the-job use of consumer and mobile technologies is making it even more essential for IT staffers to have bona fide construction and industry knowledge.

"Our end-user community wants apps, and they want them fast and they don't care if they're well baked," Lamonica says. "In order to deliver what they need now, you need to know exactly what it is they're trying to do."

For example, a project manager will walk a construction site and plan the entire job with a mobile app. That information is automatically passed to a purchasing agent. "To build those kinds of mobile apps, you have to know intimately what they need and want," he says.

Pittsburgh-based Alcoa is a prime example of a company that relies heavily on IT-plus professionals.

NANCY WOLK, CIO, Alcoa

"At its core, Alcoa is a manufacturing organization, and within the manufacturing processes, we win or lose against our competition," says CIO Nancy Wolk.

Alcoa has a broad initiative under way known as Smart Manufacturing, which Wolk says heavily leverages technology to drive profitability through efficiencies in manufacturing operations. IT staffers and process control engineers work side by side in a global 250-person information processes group. The group is headed by CIO Philip Morrissette, whom Wolk describes as an "IT-plus expert" who is "very much an expert in our vertical industry."

A 33-year veteran of the $23.7 billion manufacturer, Morrissette joined Alcoa with a computer science degree. After a few years, he moved to an IT manager's role at a smelting power plant and mining facility in Texas. At one point in his career, during a strike by unionized labor, he went to work on the plant floor, driving trains and setting controls, he recalls.

Now, about one-third of his team in the information and processes group is made up of predominantly IT people who spent time in the plants and now work on manufacturing execution systems. "They're growing with the job," Morrissette says, adding that the other two-thirds are process control engineers.

"Typically, you don't see engineers move into the IT space. They stay on the process side," he says. "But we certainly have IT individuals who came on board as programmers and are now sitting in the processes group performing engineering roles inside of our information processing systems."

At Alcoa's Power and Propulsion business unit, a project under way for the U.S. Air Force requires a highly detailed genealogy of every manufactured part that goes into each plane. "It helps the Air Force do a better job with predictive maintenance," explains IT director Phil Helal.

But to deliver that level of service, "you have to have IT professionals who understand every step of the [manufacturing] process in order to extract, store and manage all of the information," Helal says.

Additionally, and perhaps most important, there's "a huge financial incentive" for IT to deeply understand the manufacturing process, which also happens to be highly regulated, he adds.

For example, Helal's business unit is piloting software-based tools that will enable 2D and 3D representations of castings in progress as a way to more accurately identify and correct defects and variations in real time.

"A piece of scrap for us translates to millions of dollars over the course of the year, so you need people [in IT] who understand the process and work very closely with operators on the floor," he says. "They know enough that they could conceivably step in and do that job."

That's IT-plus. ◆

VENDOR MANAGEMENT is one of the key areas where IT-plus credentials can yield a big payoff, according to Laurie Anne Buckenberger, assistant vice president of corporate IT and a nurse practitioner at Continuum Health Partners in New York.

For example, Continuum doesn't entertain canned sales pitches from software vendors. Instead, Buckenberger's team of clinicians in IT present vendors with very specific requirements, right down to the policies, regulations and individual workflows they need to have supported in automated systems used at Continuum's hospitals.

"All the software vendors have buttons to do X, Y and Z, but what we ask is if they can support our New York state regulations and the clinical outcomes we want to achieve," she says. "A clinical background helps tremendously."

This has been especially true in adhering to so-called "meaningful use" requirements set forth in federal regulations that funnel stimulus dollars to hospitals that comply with certain electronic health record standards.

Under the requirements, hospitals need to show not only that they are collecting patient information electronically, but also that they are using it in a meaningful way – for example, by improving the ways in which they treat stroke patients. This requires the input of clinicians as well as IT professionals with deep clinical experience.

"It was truly a partnership between vendors, IT and clinical users, because you had to make the system useful to achieve the compliance goals," Buckenberger says. "It all adds up to millions of dollars."

– JULIA KING

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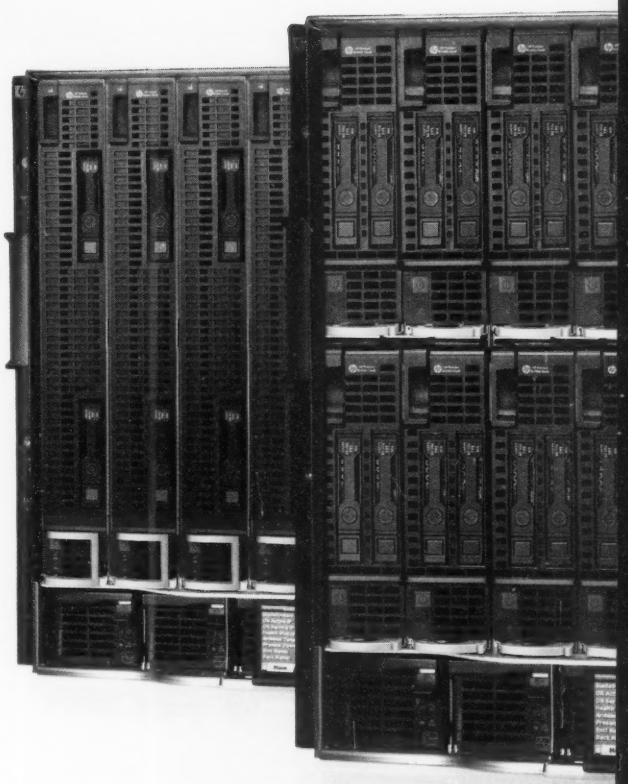

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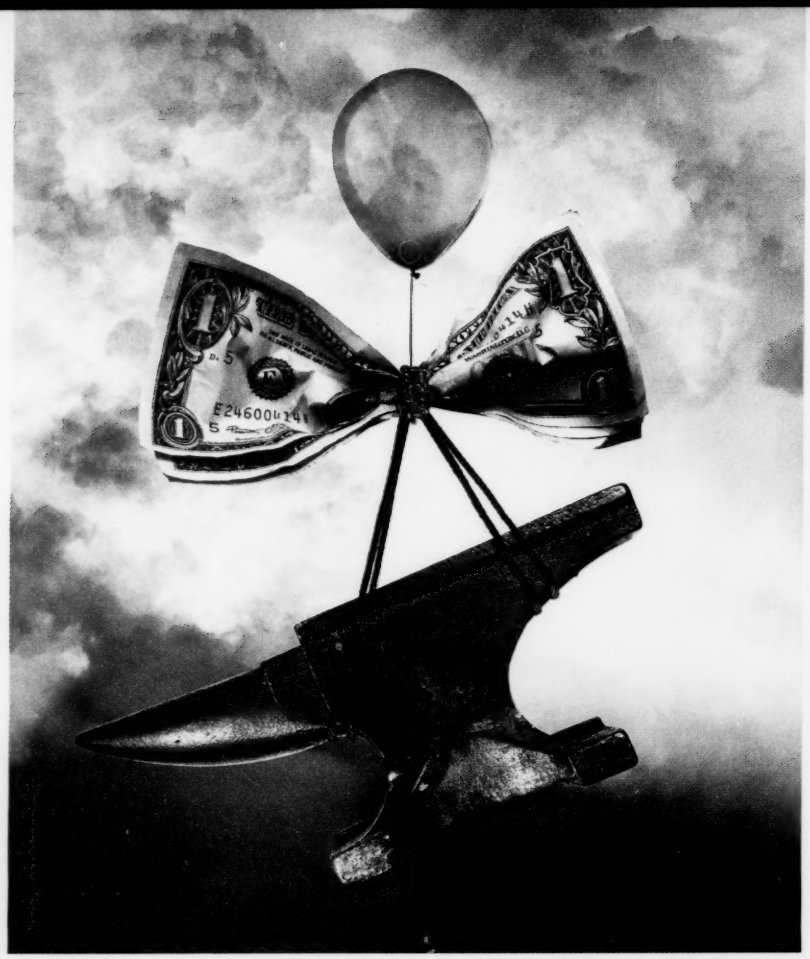

SQUEEZING SAVINGS FROM THE CLOUD

Determining whether cloud services will pay off is an extremely complicated process. Here's how to compute the ROI.

BY NANCY GOHRING

THE KEY to earning a positive return on investment when adopting cloud services — including software-as-a-service and infrastructure-as-a-service — is carefully studying costs and benefits to ensure that such a shift will pay off.

Sounds like many of the other IT projects you've shepherded, right? But it turns out it's incredibly complex to determine whether a move to the cloud will pay off for a given application. When done in haste, that analysis can lead companies to adopt the cloud for the wrong reasons, leaving them with higher costs or an inferior product when compared to an on-premises installation.

The good news is that despite all the hype around the cloud, it appears that many businesses recognize the dangers and are proceeding with caution.

The cloud is "not a silver bullet. It's not the right answer for every

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situation," says Casey Coleman, CIO for the General Services Administration.

As the first federal government agency to deploy a cloud-based email service agency-wide, the GSA didn't have a road map to follow, she says. So in May 2009, it launched an effort to thoroughly examine its current costs and the projected costs of the cloud service.

"It is the case that it has to be well thought-out and methodical. This is an IT project like any other. You have to plan for change management, promote user awareness, ensure cybersecurity in contractual terms, like with any IT project. If you don't approach it in that manner, you might have a different experience," Coleman says. "The promise of cloud computing has been borne out in our experience."

When the GSA adopted Google Apps for email in July 2011, it was able to realize added cost savings by also transitioning non-email systems that were attached to its legacy email system. The agency had been using Lotus Notes for email, plus Domino for workflow apps. As part of its review of adopting Apps for email, the GSA took a hard look at the Domino apps. "We ended up reviewing those apps and eliminating most of them," says Coleman.

The GSA had 2,000 apps in Domino, ranging from small databases to more substantial workflows. It got rid of all but 500 of those, with many consolidated and reworked. Cutting so many apps meant that the GSA could then turn off 300 in-house servers, Coleman says.

Those cuts plus others enabled the GSA to project that it would save $16 million over five years by moving to Google Apps for email — and to date that estimate is proving to be accurate, Coleman says.

Not every transition to the cloud will save that kind of money, but closely examining costs and benefits may reveal that the cloud makes sense even if it doesn't impact the bottom line.

In 2009, when Northern Kentucky University switched from an on-premises installation of Exchange for student email to Microsoft's hosted offering, known then as Live@edu, it didn't save money as a result of the change. But the university gained value because the service allowed for easy integration with smartphones and online storage with Microsoft's SkyDrive service. "Even though the costs were flat, it provided more services to students," says Tim Ferguson, CIO at the university.

Just Say No — Even Temporarily

Northern Kentucky University is also in the midst of a transition to using virtual desktops rather than physical systems for its computer labs, and it has been turning down vendor offers that just don't make sense economically, hoping that still-to-come products and pricing models will eventually meet its needs.

The university decided to approach the project in "baby steps," by running the virtual desktop software on premises with the idea of transitioning it to a public cloud later, says Ferguson.

About 18 months ago, the university did trials of virtual desktop software from a few vendors, all hosted in-house. The systems didn't meet expectations in terms of either price or performance, so the university declined to implement any of the vendors' offerings. "They were surprised. We said, 'Here it is in black and white. You'll cost us more money. The ROI is not good enough. Come back to me when you can solve it,'" Ferguson says.

Since then, the university has deployed VMware's View virtual desktop software in-house and is about to start trials running the software on Dell's public cloud, and possibly others. Ferguson expects to have transitioned all of the university's labs to virtual desktops hosted in a public cloud by 2014 or 2015, and he expects that move to cut costs by about 30%.

The university closely tracks costs in order to be able to present current expenditures to vendors. For the virtual desktop project, Ferguson knows how many staff members support the current implementation, what the hardware costs and how much work is involved in doing things like deploying patches. He also knows when peaks and valleys in usage occur — and that's important information that could help the university find savings in a move to a public cloud.

> **[The cloud is] not a silver bullet. It's not the right answer for every situation.**
>
> **CASEY COLEMAN,** CIO, GENERAL SERVICES ADMINISTRATION

The data comes in handy when working with potential vendors, he says. "If I clearly articulate what it costs today, if they can't save me money, why do it?" he says. "If you can't articulate that, it's kind of hard to ask a vendor to do something for you."

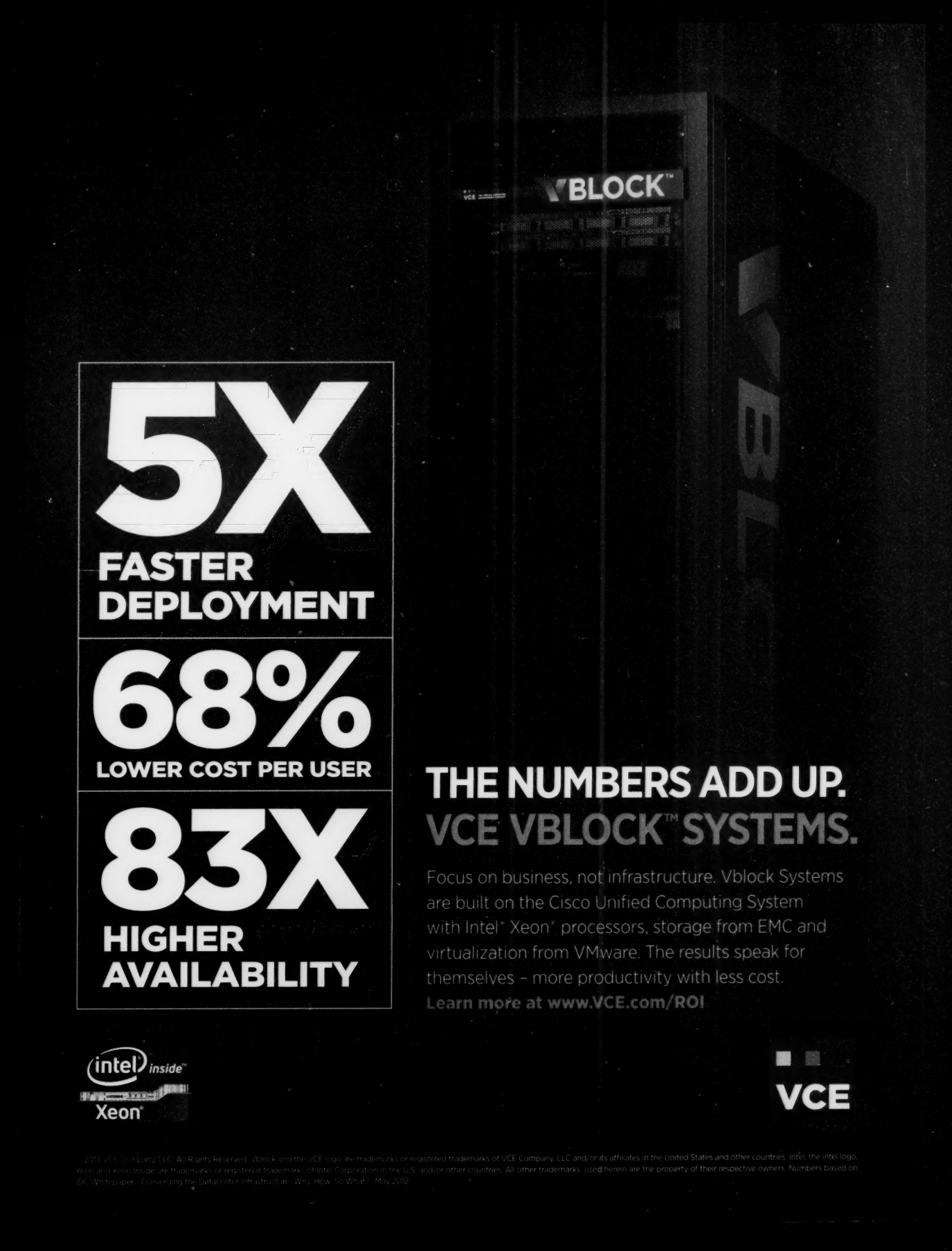
One way that Northern Kentucky is making sure cloud services save money is by pushing its vendors to offer true usage-based pricing. Many SaaS vendors that Ferguson has looked at try to charge on a per-seat basis. But that model doesn't make sense for a university that has slow times during the summer and holiday breaks. At peak usage, per-seat pricing would save the university money, but on average, because of the valleys, that model often ends up costing more than running apps in-house.

The Calculation

To try to figure out the ROI of any of its prospective cloud projects, Northern Kentucky starts with an ROI calculator and research from Gartner, adapting it for the university's own special needs.

For instance, Ferguson has strict privacy requirements since many cloud services used by the university handle students' personal identifying information, including Social Security numbers. NKU includes privacy in its ROI calculation by subtracting value when considering a vendor that doesn't seem to grasp the university's privacy requirements, he says.

When calculating ROI, the values as-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signed to various factors, such as privacy, will vary from organization to organization. One business might see security as the most important consideration, while another might place more weight on the speed at which you can add capacity, and others could deem liability to be the highest priority. "That question of value is complicated," says Marc Brien, vice president of research for Domicity, a consulting and IT analysis firm.

The value of redundancy is one factor that many organizations struggle with when transitioning to the cloud.

There are two types of organizations that don't build in redundancy when using cloud services, says Mark Eisenberg, who formerly worked on the Azure team at Microsoft and now is a director at IT consulting company Fino Consulting. The first are those that are simply unaware of the need for redundancy. They don't know, for instance, that when they move a workload to a cloud-based platform like Amazon Web Services, they must distribute that workload across data centers in multiple regions if they want to avoid the possibility of losing all of their data because of an outage in one particular area. AWS has been good about releasing white papers and other advice on how to properly do this, Eisenberg says.

In the second group are organizations that don't bother with redundancy because they make conscious business decisions not to shoulder the cost of building in redundancy. Such a decision might make sense if the systems running on the cloud aren't mission-critical. "It depends on what they stand to lose," Eisenberg says.

The cost of building in redundancy can be daunting. Take data storage. It costs twice as much to fully replicate data. But there are also architectural decisions to consider. Having two data stores separated by a long distance introduces latency when syncing the stores. For many applications, that latency might not matter. But for some types of applications it could create problems.

Cost is a factor for compute redundancy too. Businesses that can tolerate the delay involved with spinning up new cloud-based servers — usually around five minutes — can wait until a problem occurs before they fire up backup instances, Eisenberg says. Others may run half as many additional servers instead, because they can tolerate some latency with their apps better than they can handle a complete outage for a few minutes.

The Scale Issues

Architecting scale also is a challenge that comes with cost repercussions. "Just as in the on-premises world, where capacity is kind of an art more than a science, it's the same in the cloud," Eisenberg says. "It's easy to say 'I'll just have more capacity than I need,' until you find out the high costs associated with doing that."

> **We [told vendors], 'The ROI is not good enough. Come back to me when you can solve it.'**
>
> **TIM FERGUSON,** CIO, NORTHERN KENTUCKY UNIVERSITY

SaaS deployments come with their own set of potential cost overruns. SaaS providers often offer their best deals to customers that agree to multiyear contracts. But that leads to vendor lock-in and restricts users from switching to services that might better meet their needs. "So you have this three-year contract. Maybe you outgrow it or maybe you find another app that does a similar thing but better," says Connor Sullivan, an analyst at IDC who follows cloud computing. Businesses in that position likely feel trapped with an app that's not the best fit or they end up "double-dipping" — signing up for a new service at an added cost, he says.

Businesses also should thoughtfully consider costs over time. It turns out that prices for SaaS apps in general aren't coming down the way that many people once predicted. Historically, the thinking was that as more users turned to cloud services, economies of scale would reduce costs for all, Sullivan says.

Some providers like Salesforce.com have true multitenant cloud services and are benefiting from scale. While Salesforce is passing those savings on to customers, it is also continually adding new features, which cost extra. "People want those new functionalities and so the cost to the end user hasn't gone down," Sullivan says.

"The message we've been drumming is it's all about scale," Eisenberg says. "If your business problem is not about scale, cloud is in all likelihood not your ideal solution."

The type of workload an organization hopes to move to the cloud will also determine whether the transition makes sense economically. "We have paid close attention to what sort of circumstances make for a successful cloud deployment," the GSA's Coleman says.

Underlying the decision is the pressure on IT managers from their bosses, "who are looking at the success of Amazon and saying, 'Why can't you take 10% off your budget?'" Brien says. At the same time, those IT people don't want to rush into using a cloud service for the wrong reason only to see it cost more or impact their service levels.

All those pressures mean that enterprises are taking it slowly. Larger businesses are still at the stage of "primarily playing around" with the cloud, Brien says, as they try to decide which apps make sense there. "They're just moving slowly, doing it bit by bit," he says.

"It's really early days, even though all you ever read about is the cloud," he says. "The overall economics of the cloud are that it will ultimately absorb most machine cycles, but it will not happen as fast as people tend to think it will." ◆

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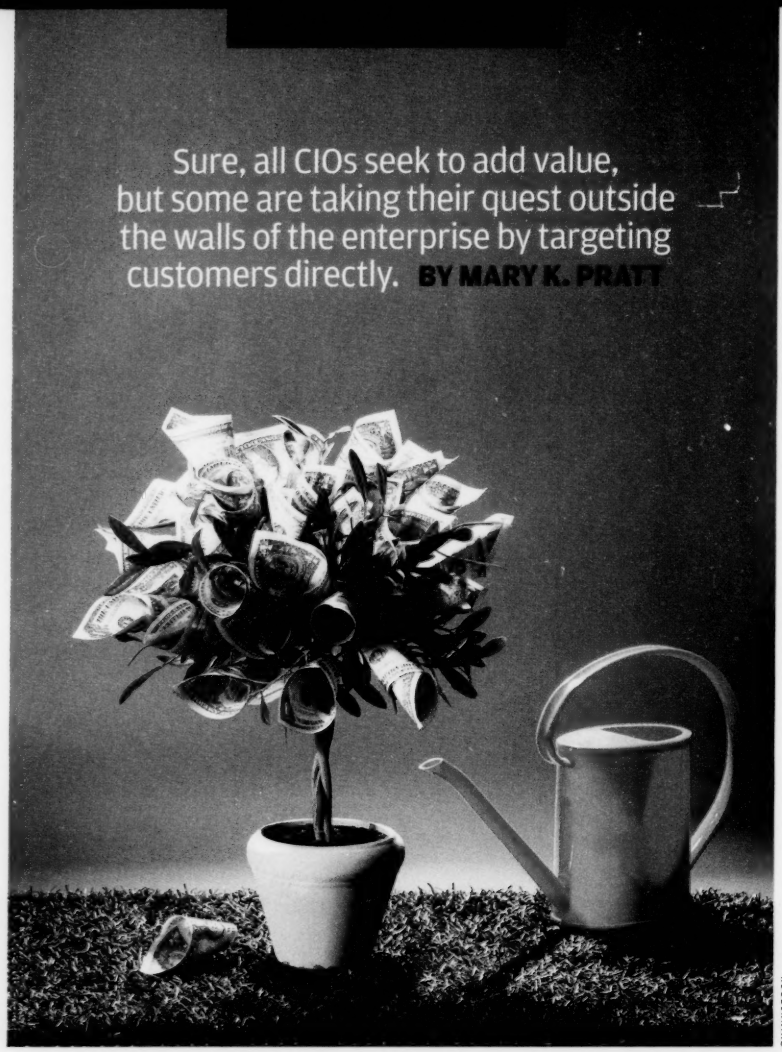
New Task for CIOs: MAKE MONEY

Sure, all CIOs seek to add value, but some are taking their quest outside the walls of the enterprise by targeting customers directly. **BY MARY K. PRATT**



THINKSTOCK

JAMES QUINN was primarily thinking about helping customers, not making money, when he gave his IT team a task.

The PHI Inc. CIO challenged his staffers to find ways to deepen the level of engagement between PHI, a Lafayette, La.-based provider of helicopter services, and its customers, including some of the world's biggest energy companies — which rely on PHI for transportation to oil rigs in the Gulf of Mexico.

But Quinn was perfectly happy when the suggestions went beyond customer engagement to include actual revenue.

"I tasked the IT department to come up with ways to integrate with customers, so they'd have some loss if they moved away from us," he explains. "We were looking for some value-add, and it just happened to turn into a revenue-generating set of products."

One of those products was Helipass, a full-size kiosk that connects to a Web-based application to provide customers with passenger and baggage manifests. Others included new hardware and SaaS offerings.

Quinn projects that the products will bring in $1.3 million to $1.5 million the first year and $20 million in annual revenue by year five. PHI took in nearly $540 million in revenue in 2011.

It's no mistake that Quinn's 76-member team hit pay dirt by turning its focus from internal PHI operations to the operations of its external customers. It's an endeavor outside the traditional scope of work for IT departments but increasingly on the radar of forward-thinking CIOs.

"Most CIOs are internally focused, and that's a big enough job as it is," says Frank Scavo, an analyst at Constellation Research. "When it comes to delivering smart products to customers, it's usually in the product development or marketing group. It's unusual to see CIOs stretch into that role, but CIOs are looking at ways to deliver more value to the organization."

Here's a look at how Quinn and other IT leaders got their teams involved in revenue-generating endeavors.

PHI: Filling a Customer Void

Two years ago, Quinn's staffers identified a gap in how the company's clients tracked shipping and travel information. As the former owner of a software development company, Quinn drew on his entrepre-

neurial experience to come up a five-year plan to develop software and hardware to fill that void.

His team developed a system that includes kiosks, small wall-mounted machines akin to ATMs and Web-based software that tracks employees and freight from helicopter and ferry terminals out to sea and back. The software, which PHI sells and supports in a software-as-a-service model, also tracks employee HR information, such as compliance with safety and training requirements. It's designed to work on a range of devices, from tablets to desktop PCs, says Quinn.

The kiosks (designed by PHI tech workers and built by an outside vendor) can sit anywhere a client needs them, including third-party transportation terminals. PHI also offers a handheld device that uses fingerprint scans to quickly account for and track workers during evacuations of deep-sea rigs.

The combination of software and hardware is a boon for PHI clients who were tracking travel and shipping data in spreadsheets or even on paper, Quinn says. Loyal customers are worth much more over the long term than the nice but comparatively small amounts of revenue the products bring in, he adds.

"That was the strategy all along — to have a happier customer," Quinn says. "We set some goals of what we wanted to do and what was going to differentiate us. We wanted to develop something unique and customer-focused."

"The strategy all along [was] to have a happier customer."

JAMES QUINN, CIO, PHI INC.

GE: Driving Profitable Growth

At GE Oil & Gas, CIO Anup Sharma's IT shop built a monitoring and diagnostics platform for the company's external customers.

Like their counterparts at PHI, GE Oil & Gas IT staffers looked for opportunities to add value for existing customers. One idea was to give them access to GE's big data systems and analytics tools.

A few technologists worked with a product leader and an engineer over a period of 18 months to develop a Web-based application called iBox that's designed to allow customers to monitor and assess the health and performance of heavy-duty aeroderivative gas turbine trains and other equipment, such as compressors, generators and pumps. Using data that GE has compiled over the years, iBox helps customers enable quick startups, maintain optimal operating conditions and avoid negative conditions like turbine trips.

The software is sold as part of a package of support services offered by GE, Sharma explains. Customers can buy the turbines without buying the services, and they can buy the support services, including the software, to monitor turbines made by other companies as well.

Meanwhile, Jim Fowler, CIO for GE Power Generation Services, oversees the IT department that developed a Web-based application called MyFleet that gives its customers — owners and operators of thermal power-generating plants — access to information that helps them to more efficiently manage and maintain their GE turbines. Fowler says his team took about four months to deliver MyFleet, launching the first release in 2011.

"It really came from the recognition that the data we use to run our own business and operations could be used to make our customers more profitable. It's that value that our customers want, and that's a win for both of us," Fowler says.

Fowler and Sharma decline to disclose just how much revenue their software brings in, but they do confirm that the products Sharma's team was able to identify opportunities for products because he had IT workers embedded in business units. "We had a level of industry domain and technical expertise to really make it happen," Sharma says.

How to Cultivate Revenue-generating IT Teams

■ **Be spot-on in delivering internal IT services and support.** If your department isn't delivering the basics with excellence, higher-ups aren't going to trust you to try innovative projects, says GE Oil & Gas CIO Anup Sharma.

■ **Forge strong relationships with other departments.** An IT team that has a deep understanding of the company's business is much more apt to be able to spot opportunities for external revenue-generating projects. Once they get the green light, technologists will most likely be required to work closely with experts in other departments to identify customer needs and market products.

Anup Sharma, CIO, GE Oil & Gas

■ **Foster an entrepreneurial culture.** Employees – and their leaders – must feel comfortable taking risks, Sharma says. "A CIO can drive this by having the right environment by encouraging people to be curious," he says.

At the highest corporate level, GE has established a software center of excellence to support innovation in IT departments across the various GE divisions, says Jim Fowler, CIO for GE Power Generation Services.

The center of excellence will enable GE's various IT teams to share components, such as user interfaces, that could be used in multiple products designed for client use.

"It will help us grow faster," Fowler says.

— MARY K. PRATT

both add to the company's bottom line and increase GE's competitiveness in the marketplace. "We think about it as driving profitable growth," Sharma says.

Purdue University: IP Generates Revenue

Despite such success stories, Constellation analyst Scavo says he doesn't expect revenue generation to become the norm for IT departments. "Many CIOs don't have the skills or interest," he says.

Chris Curran, chief technologist for the PricewaterhouseCoopers advisory practice, agrees. While successful CIOs will continue to collaborate with C-suite colleagues to create value internally, he says, only a small number of CIOs are able to bring products to market. Such ventures tend to be one-time results of opportunistic activities rather than ongoing objectives.

> **If internal people will pay for [products], there's a very high likelihood others will, too.**
>
> **GERRY McCARTNEY,** CIO, PURDUE UNIVERSITY

The one exception might be in nonprofits and industries where organizations don't directly compete with one another, Scavo says. In sectors like public transportation, healthcare and government, IT leaders could explore the prospect of turning their internally developed software and systems into money-making products without worrying that they're providing rivals with a competitive advantage.

At Purdue University, Gerry McCartney, CIO and vice president of IT, is looking at selling internally developed software to other universities.

Educational institutions, like many businesses, are seeking new revenue streams, and IT is a logical partner to help in that quest, McCartney explains.

"We produce a lot of intellectual property, and we have not historically done a very good job of turning [that IP] into revenue," says McCartney, who, as inaugural director of Purdue's Innovation and Commercialization Center, is overseeing the push to change that.

One project that's part of that push involves an application called Course Signals. Developed by the Purdue IT team, Course Signals is designed to monitor student behavior and academic performance to identify individuals who may be at risk of earning low grades. IT can prompt faculty members to intervene and suggest actions they could take to help students improve their grades.

Purdue has licensed Course Signals for distribution, demonstrating how initiatives that initially draw attention to the quality of work done internally by IT can generate revenue, McCartney says. One good rule of thumb, he says: "If internal people will pay for it, there's a very high likelihood others will, too." ◆

Pratt *is a* Computerworld *contributing writer in Waltham, Mass. You can contact her at marykpratt@verizon.net.*

Protect Your Intellectual Property

AS IT DEPARTMENTS dip their toes into the waters of the commercial marketplace, they need to be mindful of the twin needs to protect their intellectual property and avoid infringing on the intellectual property rights of others.

After all, you don't want to develop a critical application only to later learn that some piece of code wasn't yours to use, or find that a competitor managed to come to market with something similar because you didn't take necessary legal precautions.

. That's why the development process in the IT department at GE Power Generation Services includes a review by an internal control and compliance team. That team looks at whether a proposed project could infringe on any other entity's intellectual property rights or whether it needs any IP protection to guard against infringement by others.

Jim Fowler, **CIO, GE Power Generation Services**

"We're taught very early in our careers at GE to think about infringement and protection," says Jim Fowler, CIO for GE Power Generation Services. IT workers attend training on copyright and IP protections so they learn to keep these issues in mind as they work, he explains.

IP attorneys say that's a smart strategy, since technology increasingly is what differentiates one company from the competition.

"Any time you [develop] software or hardware, you want to make sure, first, that you can do that – that you're not violating someone else's IP rights," says attorney David Burns, a partner in the Boston office of McCarter & English. Second, companies need to ensure that they're safeguarding their investments via some sort of IP protection, he says.

Robert J. Tosti, a partner in the Boston office of Brown Rudnick, says companies should follow these three basic steps, whether they're developing something for internal use or external sale:

- Determine whether the proposed product violates someone else's IP rights, including a licensing agreement or a patent.
- Ask what kind of protection might be needed. Software is automatically protected by copyright, but copyright protection has limits. Some applications can be patented, which offers a higher level of protection, Tosti says.
- Consider asking employees to sign confidentiality and nondisclosure agreements to ensure that anyone who leaves the company won't share proprietary information.

The cost of taking those steps in advance may reach into the thousands, say Tosti and other IP attorneys, but the cost of addressing an IP problem later on is often much higher.

MARY K. PRATT

Security Manager's Journal

MATHIAS THURMAN

A Little Security Housecleaning

Our manager finds the time and opportunity to cross a few nagging items off of his to-do list.

I AM NEVER WANTING for risks and vulnerabilities to address. These are things that can get pushed aside by the emergency of the day, budget constraints or the internal politics of the organization. But when the time is right, I push for change. Here are three things that I'm currently tackling.

VPN configuration has always been a point of contention between the security, desktop and network teams. Our current VPN client is deployed in a split tunneling mode. When someone is using the VPN client, only resources on our network are forced to go through the encrypted VPN tunnel. Everything else, such as webmail, social media and personal file storage like Dropbox, is routed through the user's local Internet connection.

That leaves a lot of a remote user's Internet traffic unprotected and uninspected. The traffic that stays out of the tunnel doesn't come up against our state-of-the-art firewalls for URL content filtering and is invisible to our intrusion-prevention tools, our advanced malware analysis system, our application layer inspection technology and our data loss prevention (DLP) software for identifying when sensitive information is leaked.

My objections to split tunneling have always been met with counterarguments from the network and desktop teams who worry that users will suffer performance slowdowns if all client VPN traffic is forced through our company's infrastructure. That stalemate might soon be broken, though, since the network team plans to upgrade circuits and add functionality this year, so performance won't be hit if we disable split tunneling.

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The next risk I might be able to mitigate is **Web-based corporate email.** We deployed Microsoft Outlook Anywhere a few years ago so users could launch the Outlook client without having to be connected to the VPN. What I don't like is that it can be configured to pull mail from our servers to any PC. That would include shared, public PCs, like the ones in hotel lobbies. Once a user is done checking his mail on such a PC, he walks off, leaving the mail and calendar and contact info on the machine. Any subsequent user of that public computer could open the Outlook client and see all that information, some of which could be highly sensitive in nature. They might not be able to connect back to the Exchange server to send or receive mail, but the email, attachments, contacts and calendar items will be visible.

My preference is to use the browser-based Microsoft Outlook Web Access (OWA). With OWA, when the browser is properly closed and all Web history, cookies and cache have been cleaned, virtually no mail is left on the client PC. And that is the route we are taking, by migrating all of our employees to Microsoft 365 for cloud-based email. We will restrict Outlook Anywhere access to corporate PCs.

The third item on my list is a problem that involves **permissions.** It was discovered during the investigation of a recent DLP incident. The DLP analyst discovered that the permissions for a departmental file share that contained sensitive business documents were set so that all domain users could list the file contents of any folder. Although the users couldn't download or view the contents of files, just displaying folder or document names can be risky. For example, say that the human resources department had a folder named "Layoffs," and inside that was a spreadsheet called "2013 Reduction in Force." Anyone who saw those names would likely make assumptions, and layoff rumors would soon be flying.

Having found that several folders were configured in this way, we will mandate a review of all departmental file shares to ensure that permissions are set properly. We are also planning some new technical controls and processes to prevent improper permissions from being set. ◆

This week's journal is written by a real security manager, **"Mathias Thurman,"** *whose name and employer have been disguised for obvious reasons. Contact him at mathias_thurman@yahoo.com.*

"When the time is right, I push for change. Here are three things I'm currently tackling.

Trouble Ticket

» **At issue:** Some problems can't be addressed until the time is right.

» **Action plan:** This could be a good time to tackle three of them.

S.J. VAUGHAN-NICHOLS

The CIA and the Cloud

Get this: The CIA sees the cloud as being more secure than conventional IT systems.

IF YOUR COMPANY mistrusts the security of the cloud, it might want to take a look at what The Company is doing.

"The Company" is a term that insiders have long used to refer to the CIA. Is there any organization that takes security more seriously? Perhaps, but probably not within the Fortune 500. And yet the CIA appears to be moving to the cloud.

Seriously. According to *FCW*, a publication that tracks the intersection of government and technology, the CIA has agreed to a cloud computing contract with Amazon that may be worth up to $600 million over 10 years. Specifically, Amazon Web Services will help the intelligence agency build a private cloud infrastructure.

What? You expected the CIA to put its secrets on the Amazon EC2? I don't think so!

But get this: One reason the CIA started moving to cloud-based computing in 2009 was that it saw the cloud as being more secure than conventional IT systems. Back then, Jill Tummler Singer, who was the CIA's deputy CIO at the time, said, "By keeping the cloud inside your firewalls, you can focus your strongest intrusion-detection and -prevention sensors on your perimeter, thus gaining significant advantage over the most common attack vector — the Internet."

While we don't know exactly how the CIA will be using Amazon's services, it's a safe bet that it will be creating its own private clouds. But the hardware used for those clouds might not be hosted on the grounds of the CIA's Langley, Va., headquarters. Instead, the agency's cloud hardware may well end up hiding out somewhere in Amazon's mammoth U.S. East data center, located in nearby Ashburn, Va. Why? Well, just like any other government agency or private business, the CIA wants to save money in its IT budget.

Now, I'd have to say that if the CIA trusts the cloud, just about anyone can trust it — provided, of course, that you always keep your eye on security and make sure you and your vendor are taking the steps necessary to safeguard your data. As Michael McConnell, former director of the National Security Agency, said last year, "The economics of the cloud are so compelling they can't be denied. [But] we have to get the security aspects right."

How do you do that? The CIA isn't likely to tell you, or to leak its cloud plans in the next season of *Homeland*. But there are guidelines from groups such as the European Network and Information Security Agency on how IT shops should handle public cloud vendors and monitor their security measures.

Don't treat moving to the cloud as some kind of commodity purchase. You are always going to need to do your homework to make sure that your cloud-based services are properly kept up to date and use best security practices.

As Mark Gilmore, president and co-founder of Wired Integrations, a California-based technology consulting firm, recently observed, if your "people fail to meet security standards, such as using complex passwords, and leave machines running for days on end, the likelihood of intrusion is going to increase and eventually resources will be hacked." In short, security basics remain the same, whether you use cloud-based systems or have an in-house client/server setup.

The Company knows that, and so should your company. ◆

Steven J. Vaughan-Nichols has been writing about technology and the business of technology since CP/M-80 was cutting-edge and 300bps was a fast Internet connection — and we liked it! He can be reached at sjvn@vna1.com.

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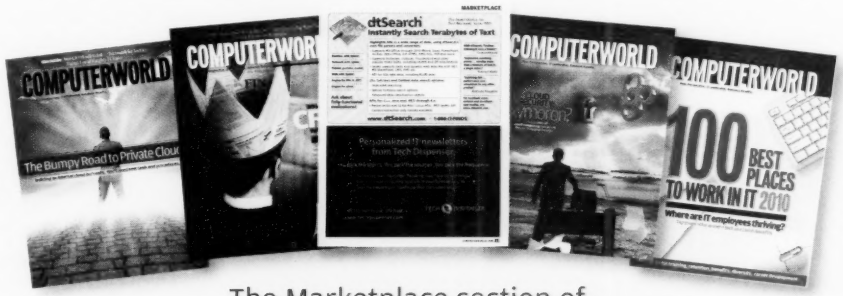

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Source: *Harvey Ad Measurement Study, Computerworld May 10, 2010

Career Watch

ASK A PREMIER 100 IT LEADER

Zack Hicks

The Toyota Motor Sales CIO answers three questions on **networking as a career choice.**

I just got a degree in computer engineering and plan to go into networking, database management and, later, security. Does this sound feasible, or should I just pick one? If the latter, which one should I pick? At Toyota, I encourage my IT associates to rotate through our different technical and nontechnical roles. My path to CIO was by no means a straight line, but I found that the perspectives gained from both technical and nontechnical roles set me up for success as a CIO. I would encourage you to get as varied experience as you can. That being said, if you find that you have a passion for networking, database management or security, you can find great success by becoming an expert in any of those areas.

And for readers currently in school, I cannot stress enough the importance of a summer internship, which provides exposure to real-life business processes and often gives you an edge when you're applying for full-time jobs.

I have a bachelor's in business administration and an A+ certification. Right now, I am a network technician, but what I really do is basic help desk support with some network stuff on rare occasions. I would like to expand my expertise and skills in networking and security for a higher-paying job. Is this a reliable route to take? What certifications would you suggest? I've been thinking of getting CompTIA Network+ certification, but I've heard a lot of people say to get a CCNA instead. Networking is a top skill. Three areas of focus for networking would be wireless, WANs and security. With so many mobile devices coming into the corporate world, in addition to the movement to cloud computing, this is a great space.

I suggest the following network classes and certificates: A CCNA certification (in routing/switching, wireless and security) would be more specific than Network+ admin classes and would give you more marketable skills. After that, I suggest you look into a CCNP, if you want to upgrade your network skills further, and a CISSP to round out your security knowledge and experience. Network and security roles are continuing to become more important in my organization. With Toyota Entune, most of our cars have amazing telematics features that require advanced networking services and hardened security. It takes very experienced individuals to provide these services.

I'm wondering whether a move into network support and administration would be a good hedge against outsourcing. I don't want to guess wrong, because I'll have to pay for my own training. Generally, a company's outsourcing strategy is based on the unique needs of the organization. What I have noticed among my peers is that skills such as networking, data/business intelligence and security are, more often than not, locally sourced, but it would be difficult to predict what your experience will be. For whichever area you choose to focus on, my advice would be to spend time understanding the emerging technologies in that space and think creatively about how they can be applied to business. The ability to demonstrate this type of innovative thinking is highly valued.

If you have a question for one of our Premier 100 IT Leaders, send it to **askaleader@computerworld.com,** and watch for this column each month.

THE **BIG** NUMBERS

19.8% ■ **The number of bachelor's degrees awarded to computer science majors by Ph.D.-granting universities in the U.S. increased by 19.8% in 2012 compared with a year earlier.** It was the third year in a row that the percentage increase was in the double digits, reflecting an uptick in the fortunes of the cyclical IT jobs market. According to Peter Harsha, the director of government affairs at the Computing Research Association, CRA members have said that the recent upward trend is due at least in part to the fact that "students are much more aware of the importance of computational thinking in just about every other field of science and technology."

29.2% ■ **The cycle appears to be on the upswing, since even more undergraduates are flocking to computer science.** According to the CRA survey, the number of new undergraduate computer science majors at Ph.D.-granting U.S. universities rose by more than 29% last year, an increase that the CRA called "astonishing."

It was the fifth straight year in which the number of students enrolled in computer-related degree programs rose, according to the CRA's annual survey of computer science, computer engineering or information departments at Ph.D.-granting institutions.

— PATRICK THIBODEAU

SOURCE: THE COMPUTING RESEARCH ASSOCIATION'S ANNUAL CRA TAULBEE SURVEY

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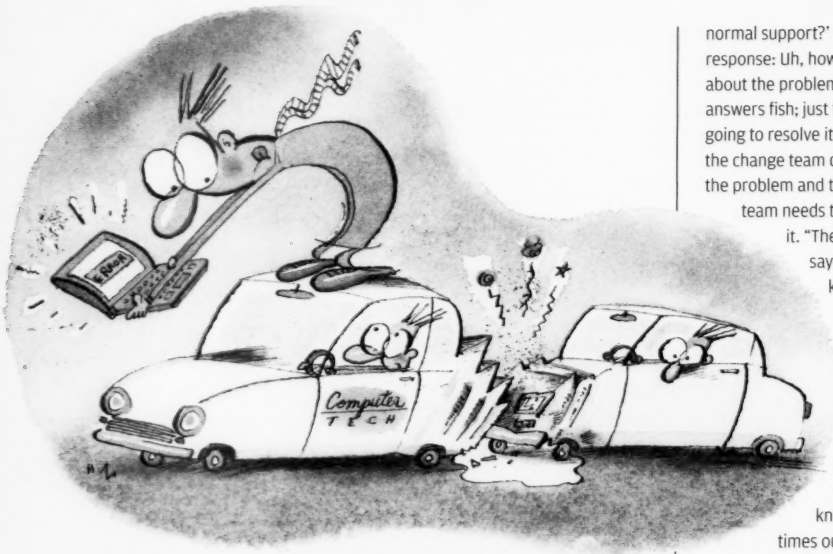

HAL MAYFORTH

Do Crashes Come in Threes?

Working-from-home pilot fish arrives at his desk bright and early one morning to find his laptop displaying a dreaded message: *Operating system could not be found.* "On the fifth restart attempt," fish says, "the system somehow takes, and I am, for the moment, functional. I spend several hours with the vendor's tech support, and they conclude that I had a major disk error. Good news: I am under warranty for that, and they'll send someone next day to install a new disk. Bad news: I'm sitting on a time bomb – and I have a deadline." Fish crosses his fingers and makes his deadline – and next morning the laptop still hasn't crashed. The repair tech calls to confirm his appointment, so the worst is over, right? Not even close. "About 30 minutes before the appointment, dispatch calls me. The repair guy has had an accident," says fish. "Rear-ended. He's fine, but his car is smashed. And my parts? They were packed safely away – in his trunk. As the oh-so-funny dispatcher said: 'The parts are still there. In fact, the parts are now in a lot more parts.' They're going to try again tomorrow."

Pretty Good Odds

This IT pilot fish has a chat with a member of his company's change team – the techs who work up server changes and then hand them over to the business-as-usual team. Reports fish: "I said to the guy, 'I hear you had problems on Saturday. How are you coming along with fixing them before we take the server under normal support?' " The stammered response: Uh, how did you hear about the problem? Never mind that, answers fish; just tell me how you're going to resolve it. And the guy from the change team does, describing the problem and the testing the team needs to do to get around it. "The really sad part," says fish, "is that I knew nothing about any problems on Saturday." But he figured that the odds were with him, because he used to work on the change team himself and knows that "nine times out of 10, they have issues," and also that the team has a tendency "to try to hide issues and force us to pick them up once we've accepted the server." After all, "if we don't know about the problem, how can we ask them about it?" The gamble paid off, and fish's team refused to accept the server into support until the problem was fixed.

Well, No

An early-morning training session goes awry when half the students in the class get a blank screen instead of the virtual training desktop. "I determine that a reboot will resolve the issue," reports a pilot fish on the scene. "As I ask the users to restart, a voice pipes up from an adjacent cubicle: 'Can you come over here and show me how to reboot without shutting everything down?' "

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OPINION

PAUL GLEN

When Teams Are Toxic

Toxic teams have caught a superbug, the organizational equivalent of drug-resistant bacteria.

SENIOR MANAGERS need to act when they realize that the project they are responsible for is heading for disaster. But how do you know whether that action should be applying a little pressure, tweaking the process, parachuting in your best troubleshooter or completely overhauling the project team?

When faced with this dilemma, most managers lean toward minimalist approaches, because radical interventions carry bigger risks. Excessive interventions can impose unnecessary costs, introduce new problems or destroy morale. Unfortunately, small changes rarely fix big problems.

The biggest problems crop up when the group develops a toxic culture. Such teams passively refuse to implement new processes, push back against changes to deliverables or poison the goodwill of anyone you add to the group. They have caught a superbug, the organizational equivalent of drug-resistant bacteria. A toxic culture can't be rooted out with small modifications to processes or personnel. You need to do something big, like canceling the project or overhauling the team.

Here are five warning signs that might indicate that you have a toxic team:

Apathy: Toxic teams have no sense of urgency about anything. They put in no extra effort to meet a deadline, don't become frustrated by obstacles and religiously stick to regular office hours. The team's members may not be naturally apathetic people, but they have come to believe that they are helpless to control their own success.

Antipathy: Toxic teams are animated by self-righteous hostility toward other groups in the organization. It can be healthy for a team to want to prove how good they are (or even how much better they are than everyone else) by delivering spectacular successes. You have trouble, though, when that mutates into a determination to show how bad everyone else is by treating them disrespectfully and openly denigrating their abilities and intentions.

Rigidity: Toxic teams can be pervaded by a dogmatic belief that there is one and only one right way to do anything. For them, compromise is evil. But technical work is all about compromise, and refusal to engage in it is a very bad sign. Be aware, though, that you might mistakenly see teamwide rigidity when actually it's a case of one difficult leader or a sponsor who is asking for technical impossibilities.

Repetition: Everyone makes mistakes, but toxic teams repeat the same ones over and over. That suggests that the group's leaders are either unable to learn from their mistakes or are incapable of changing how the group thinks or behaves.

Isolation: Toxic teams never come to you proactively with information on progress, problems or questions. They avoid communicating with sponsors and users, especially when they know that there are delivery issues. In the worst cases, they actively avoid contact initiated by others.

When you see these problems, you need to make decisive changes that get attention, remove obstacles and unambiguously demonstrate your commitment to the behaviors and values the team needs to succeed. You may need to fire or remove the team's leaders, cancel service contracts, reorganize the team structure or demand that they redo unacceptable work.

I see risky and pervasive interventions as a last resort. But when you see teams with deep dysfunctions that virtually guarantee their failure, you shouldn't hesitate to take bold action. ◆

Paul Glen, CEO of Leading Geeks, is devoted to clarifying the murky world of human emotion for people who gravitate toward concrete thinking. His newest book is *8 Steps to Restoring Client Trust: A Professional's Guide to Managing Client Conflict*. You can contact him at info@leadinggeeks.com.

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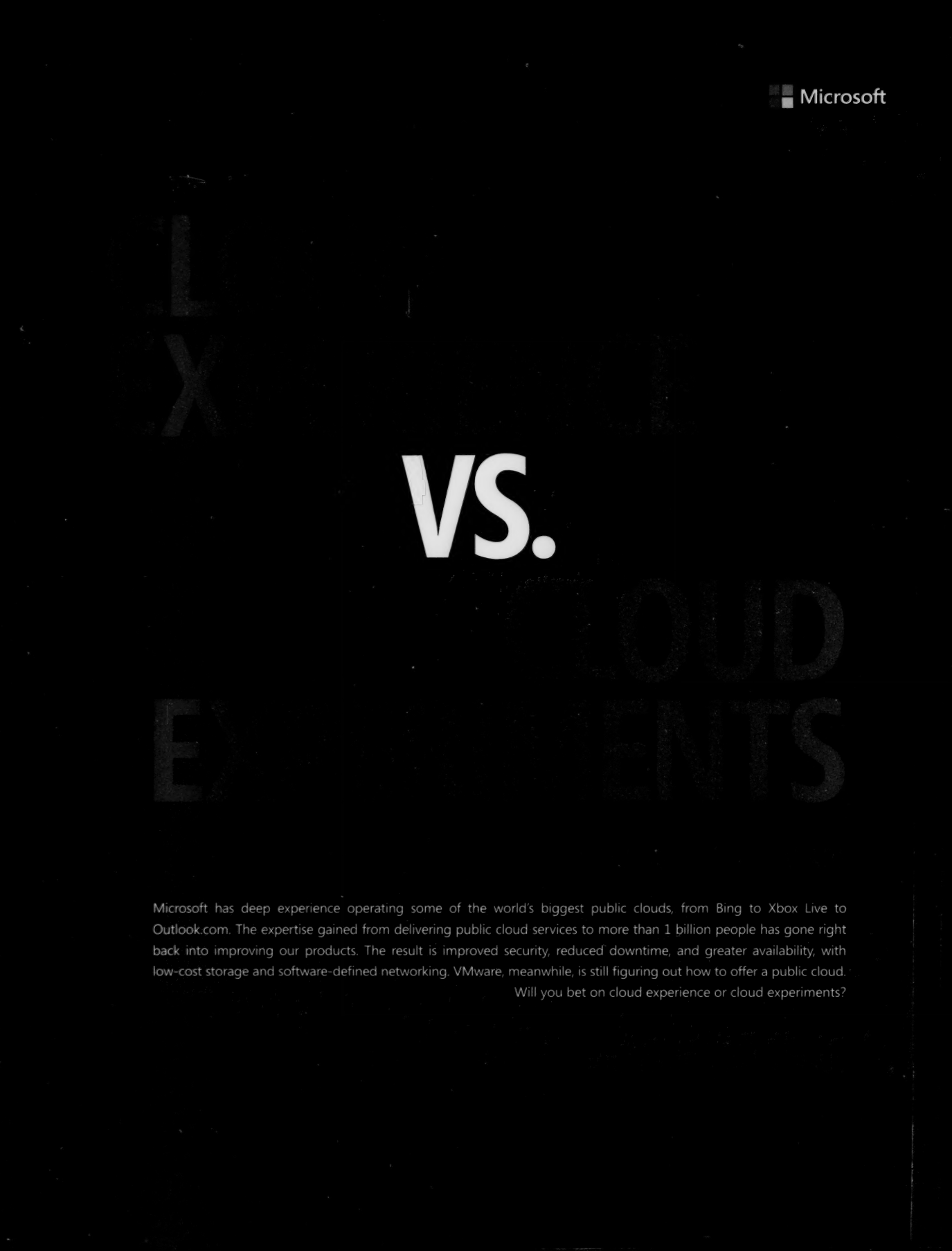
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